RECEIVED
CENTRAL FAX CENTER
JAN 12 2007

CERTIFICATION OF FACSIMILE TRANSMISSION

I hereby certify that this paper is being facsimile transmitted to the USPTO at (571) 273-8300 on the date shown below.

JANUARY 12 2007 Francis C. Hand
Date Francis C. Hand

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Art Unit:	1724
Examiner:	Scott Bushey
Applicant:	Florian Kehrer
Serial No:	10/780,243
Deposited:	February 17, 2004
Title:	Liquid Distributor

Customer No.: 27162

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Appeal Brief

Sir:

This is an appeal from the Final Rejection dated October 18, 2006 of claims 1, 2, 4-8, 10, 13, 15-18 and 20.

Please charge the filing fee of $500.00 and any additional fees to Deposit Account 03-0678.

01/16/2007 AWONDAF1 00000070 030678 10780243
01 FC:1402 500.00 DA

TABLE OF CONTENTS

REAL PARTY IN INTEREST

The real party in interest is the assignee of record, Sulzer Chemtech AG of Winterthur, Switzerland, pursuant to an Assignment recorded as of February 17, 2004 under Reel 015088 and Frame 0091.

RELATED APPEALS AND INTERFERENCES

There is no related Appeal or Interference.

STATUS OF CLAIMS

Claims 1, 2, 4 to 8, 10, 13, 15 to 18 and 20 have been rejected and are under appeal.

Claims 3, 11, 12, 14 and 19 have been withdrawn pursuant to a requirement for restriction.

Claim 9 has been indicated as allowable if rewritten in independent form.

STATUS OF AMENDMENTS

An Amendment After Final Rejection (i.e. a request for reconsideration) filed November 27, 2006 has been considered pursuant to an Advisory Action dated December 11, 2006.

SUMMARY OF CLAIMED SUBJECT MATTER

Pursuant to a Requirement for Restriction among species dated September 12, 2005, the species of Fig. 2 was elected. The claims on Appeal are readable on Fig. 2.

Claim 1

Independent claim 1 is directed to a liquid distributor (1; Fig. 2) comprising at least one channel (3) for receiving a flow of liquid (20); an areal guide means (4; page 4, penultimate paragraph); and at least one gutter (5; page 4, line 14 et seq).

The channel (3) has a plurality of outlet apertures (32) at longitudinally spaced apart points for an outflow of liquid from the channel (3) in a plurality of streams (23). (page 4, line 3 et seq)

The areal guide means (4) extends below the channel (3) to receive and laterally disperse at least one of the streams of liquid (23) flowing from the apertures (32) of the channel. This guide means (4) has a drip edge at a lower end for dispensing drops of the liquid received thereon along longitudinally spaced apart points. (page 4, penultimate paragraph).

The gutter (5) is disposed below the channel (3) with the guide means (4) passing therethrough. (page 4, line 14 et seq). This gutter (5) has a throttle means (25; page 5, line3 to 8) for distributing the liquid descending on the guide means (4) by means of a hydrodynamic balance (page 5, lines 13 to 16).

Claim 15

Independent claim 15 is directed to a liquid distributor comprising a primary distribution stage including a plurality of channels (3), as in claim 1, and a plurality of areal guide means (4), as in claim 1, as well as a secondary distribution stage below the primary distribution stage having a plurality of gutters (5), as in claim 1. (page 1, 5th paragraph).

Claim 17

Independent claim 17 is directed to a column (12; Fig. 1) comprising a structured packing (13) and a liquid distributor (1) as set forth in claim 1.

Grounds of Rejection to be Reviewed on Appeal

I. Whether claims 1, 4, 5, 8,10, 15 to 17 and 20 are clearly anticipated by Acker (US Patent 4,846,266) under 35 USC §102.

II. Whether claims 2, 6, 7,13 and 18 are unpatentable over Acker under 35 USC §103 (a).

Argument

I. The rejection of claim 1 as being clearly anticipated by Acker is not warranted under 35 USC 102

In rejecting claim 1, it is understood that the Examiner alleges that Acker clearly discloses one or more channels 44 having apertures 46 for the outflow of a plurality of liquid streams and guide means (52 in Fig. 7) (which pass through gutter means 14 having a tapering region and a gap) which throttles liquid flow through the distributor.

Acker does not describe a gutter having a throttle means as claimed in claim 1

Claim 1 requires "at least one gutter..having a throttle means for distributing the liquid descending on said guide means...".

Acker describes a header assembly 10 that includes three V-shaped troughs 14 that are supplied with water from a common source 20. (column 2, lines 49 to 59). As shown in Fig. 2, each trough 14 has parallel side walls 22, oblique walls 24 converging toward a common apex and a plurality of V-shaped spacing elements 26 separated by slots 28. (column 2, lines 60 to 65). As illustrated in Fig. 4, each slot 28 of the trough 14 receives a triangular-shaped clamp 36 which retains two edges 38 of two plates 40 forming evaporative cooling channels. (column 3, lines 12 to 15). The trough 14 of

Acker does not have a throttle means. Accordingly, a rejection of claim 1 as being clearly anticipated by Acker is not warranted pursuant to the provisions of 35 USC 102.

Acker does not describe a gutter having a throttle means for distributing liquid descending on the porous plastic material 52 as claimed in claim 1

In the embodiment shown in Figs. 2 and 3 of Acker, a fiberglass-woven cord 34 lays in contact with both oblique walls 24 to inhibit the flow of water in a manner to cause the water to be distributed substantially evenly throughout the entire length of the trough 14. (column 3, lines 39 to 42). Furthermore, water is substantially equally distributed at each slot 28 onto the evaporative cooling surfaces of each plate [40] without humidifying the secondary air. (column 3, lines 49 to 53).

The embodiment of Fig. 6 of Acker employs a grate 50.

The embodiment of Fig. 7 of Acker is described as comprising the identical side walls and oblique walls but instead of using a fiberglass woven cord 34 or a grate, a porous plastic material 52 is used. The porous plastic material 52 is formed in a V-shape to lay in contact with the oblique walls of the trough and slots are formed in the porous material 52 to provide uniform spacing between the attached edges of the plates [40] forming the evaporative cooling channels. Water is to flow through the porous spacing elements and into the evaporative cooling channels. (column 4, lines 3 to 20).

There is no teaching or description in Acker that the trough (gutter) 14 has a throttle means "for distributing the liquid descending on said guide means...." i.e. on the porous plastic material 52. In fact, it is the porous plastic material 52 itself that distributes the water passing through the material 52. For this additional reason, a

rejection of claim 1 as being clearly anticipated by Acker is not warranted pursuant to the provisions of 35 USC 102.

Acker does not describe a gutter having a throttle means for distributing liquid descending on the porous plastic material 52 by means of a hydrodynamic balance as claimed in claim 1

The Examiner alleges that the guide means 52 (porous plastic material) of Acker includes spaced apart drip points at the lower edge "which uniformly distribute liquid" that gathers within the gutter "to provide a hydrodynamic balance".

First, because slots alternate with depending triangular fingers in the porous plastic material 52 of Acker, there can be no uniform distribution of water from the bottom of the material 52. That is to say, water would flow in a non-uniform manner from the bottom edges of the depending triangular fingers and from the flat bottom surfaces of the material 52 between the roots of the fingers.

Second, the Examiner has not presented any basis in fact and/or technical reasoning to reasonably support the determination that the material 52 provides a hyrdodynamic balance. "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy,* 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

For these additional reasons, a rejection of claim 1 as being clearly anticipated by Acker is not warranted pursuant to the provisions of 35 USC 102.

Acker does not describe or teach an areal guide means

Claim 1 requires "an areal guide means. . . to receive and laterally disperse at least one of the streams of liquid flowing from said apertures of said channel". Acker is void of any such structure.

The porous plastic material 52 of Acker is not an "areal" guide means.

Reference is made to each of Figs. 2 and 5 of applicant's drawings for an illustration of an areal guide means. Further, the description of this application in the paragraph bridging pages 4 and 5 describes the gulde means 4 of Fig. 2 as being made of a metal weave or a fine mesh expanded grid. Still further, Webster's New 20th Century Dictionary, Unabridged Section Edition, describes the term "areal" as "pertaining to an area." Clearly, the block-like structure 52 of Acker does not constitute an areal guide means. For this additional reason, a rejection of claim 1 as being clearly anticipated by Acker is not warranted under 35 USC 102.

The porous plastic material 52 of Acker does not have a drip edge at a lower end

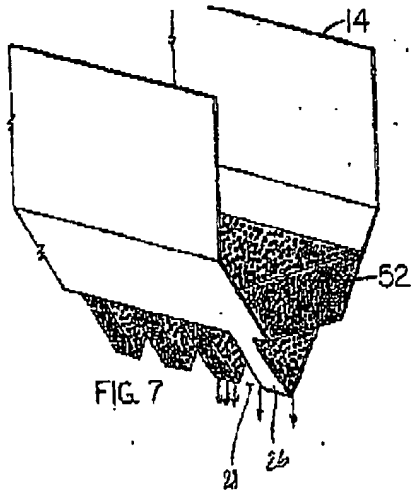
Claim 1 requires the areal guide means to have "a drip edge at a lower end for dispensing drops of the liquid received thereon along longitudinally spaced apart points". There is no disclosure is Acker of such a structure.

Acker, at column 3, lines 49 to 53, describes the water flowing into the troughs 14 as being equally distributed at each slot 28 onto the evaporative cooling surfaces of each plate [40] without humidifying the secondary air. There is no description or teaching that the water is in the form of drops.

In the Fig. 7 embodiment of Acker, water flows through the porous spacing elements of the structure 52 and into the evaporative cooling channels. (Column 4, lines 18 to 20). That is to say, the water flows sideways out of the plastic material 52 and into the area defined by the slots 28 in the oblique side walls 24 for distribution onto evaporative cooling surfaces of plates that are not illustrated. (column 3, lines 47 to 53). The water does not flow or drip off the bottom edges since, as evidenced by Fig. 4, such a water fall or drips would fall unencumbered through the spaces between the plates 40 forming the evaporative heat exchanger 12. For this additional reason, a rejection of claim 1 as being clearly anticipated by Acker is not warranted under 35 USC 102.

Fig. 7 of Acker is incorrectly shown

As noted by the Examiner, the Fig. 7 embodiment of Acker does not illustrate the spacers 26 that appear in the embodiments of Figs. 2 to 6. Applicant's position is that the Fig. 7 embodiment of Acker should be shown with spacers 26, for example, as indicated at the right-hand side in the following sketch.



As shown in the sketch, the presence of the spacers 26 would prevent a flow or a dripping of water from the bottom edge of the depending triangular portions of the porous plastic material 52.

The absence of the spacers 26 would allow water to flow from the bottom edge of the depending triangular portions of the porous plastic material 52 and directly into the spaces between the plates 40 forming the evaporative heat exchanger 12.

It is respectfully submitted that the omission of the spacers 26 in Fig. 7 of Acker is a draftsman's error in view of the description of Acker.

A review of the teachings of Acker shows that the purpose of the several embodiments of the header assemblies described is to flow water onto plates [40]. For example, Acker states the following:

> "Many state-of-the-art, plate-type, evaporative heat exchangers incorporate very thin aluminum sheets as the plate material. These plates are attached alternately along opposite edges to form a cross-flow heat exchanger. Most of these heat exchangers have a wicking material or a wetable material laminated to one surface of the plate. These material surfaces of the plates define the evaporative cooling channels" (column 1, lines 7 to 16)

> "The present invention provides significant improvements and advantages over prior art header assemblies for plate-type evaporative heat exchangers, particularly, with its inherent characteristics to provide substantially even spacing between the plates defining the evaporative cooling channels, to distribute water in a substantially uniform manner **onto the evaporative cooling surfaces** without humidification of the secondary air before it enters the evaporative cooling channels and to filter impurities and debris from the recirculated water." (column 1, lines 52 to 62.) (emphasis added)

Acker further specifically teaches:

> "The header assembly comprises a plurality of substantially V-shaped, slotted troughs disposed in a substantially parallel relationship and interconnected perpendicularly to a manifold" (column 1, lines 63-66.)
>
> "Each trough comprises two substantially parallel, rigid sidewalls, two rigid end plates and **two oblique walls which converge and attach to define an apex of a V-shaped trough.** A plurality of alternating spacing elements and slots extends longitudinally along the length of the trough and equidistantly and obliquely along vertical deep walls **at the apex of the trough"** (column 2, lines 3 to 9) (emphasis added)

There can be no question that the embodiments of Figs. 2 and 6 illustrate V-shaped spacing elements 26 separated by slots 28. The embodiment of Fig. 7 is described as follows:

> "The alternative embodiment of Fig. 7 comprises the **identical** sidewalls and oblique wall of the present invention. However, instead of using a fiberglass woven cord 34 or a grate 50, a porous plastic material 52 is used. . . . The porous plastic material 52 is formed in a V-shape to lay in contact with the oblique walls of the trough and within the upper portion of the V-shape channel of the trough. Slots are formed into the porous material 52 **to provide uniform spacing between the attached edges of the plates forming the evaporative cooling channels.** Due to the porosity in the porous plastic material 52, the flow of water is inhibited to substantially distribute evenly throughout the trough 14 above the porous material 52 and the water can flow through the porous spacing elements and **into the evaporative cooling channels.** (column 4, lines 3 to 20) (emphasis added)

Note also that claim 1 of Acker requires at least one V-shaped trough being formed with a plurality of alternating spacing element and slots. Thus, claim 1 is readable on the embodiments illustrated in each of Figs. 2 and 6, but is not readable on the embodiment of

Fig. 7 as illustrated unless, of course, the embodiment of Fig. 7 does have spacers 26 as in each of the embodiments of Fig. 2 and 6.

As illustrated in Fig. 4 of Acker, each slot 28 of the trough 14 receives a clamp 36 which retains two edges 38 of two plates 40 forming **evaporative cooling channels.** During operation, water is substantially equally distributed at each slot 28 onto the evaporative cooling surfaces of each plate without humidifying the secondary air. (column 3, lines 47 to 53). Fig. 5 illustrates an embodiment in which notches 48 are formed into the spacing elements to facilitate the flow of water from the trough 14 and into the evaporative cooling channels. (column 3, lines 56 to 60).

Clearly, the embodiment of Fig. 7 has plates 40 that form evaporative cooling channels as in Fig. 4. As can be seen by analogy in Fig. 4, if water were to flow from the apex of the depending spacer elements 26, the water would fall under gravity into the spaces between the plates 40. This is contrary to the teachings of Acker that requires the water to flow onto the plates 40.

In summary, the disclosure in Acker clearly teaches that the embodiment of Fig. 7 would include the spacer elements 26 as otherwise, the embodiment would be inoperable for the purposes intended, i.e. to flow water onto the plates 40 that form the evaporative cooling channels. Note that these channels are to convey air in heat exchange relation with the water on the evaporative cooling surfaces of the plates 40.

In view of the above, a rejection of claim 1 as being anticipated by Acker is not warranted pursuant to the provisions of 35 USC 102 . .

The rejection of claim 4 as being clearly anticipated by Acker is not warranted under 35 USC 102

Claim 4 requires the gutter of claim 1 to include "a pair of walls defining said throttle means". Acker is void of any such structure or teaching.

In the Final Rejection, the Examiner alleged that the guide means 52 of Acker throttles liquid flow through the distributor. Clearly, this "guide means 52" is not "a pair of walls" as required by claim 4. Accordingly, a rejection of claim 4 as being clearly anticipated by Acker is not warranted pursuant to the provisions of 35 USC 102.

The rejection of claim 5 As being clearly anticipated by Acker is not warranted under 35 USC 102

Claim 5 depends from claim 4 and further requires the pair of walls of claim 4 to define "a downwardly tapering region and a gap with said guide means disposed in and extending through said gap. . . ". Acker is void of any such teaching or structure. As can be seen in Figs. 1 to 6 of Acker, the cord 34 and grate 50 are fully contained within the gutter 14. Also, as noted above, the porous plastic material 52 is to be contained wholly within the gutter 14. Accordingly, a rejection of claim 5 as being clearly anticipated by Acker is not warranted pursuant to the provisions of 35 USC 102.

Claims 8 and 10

Claims 8 and 10 depend from claim 5 and stand or falls with claim 5.

The rejection of claim 15 as being clearly anticipated by Acker is not warranted under 35 USC 102.

Claim 15 contains recitations similar to claim 1 and stands or falls with claim 1.

Claim 16

Claim 16 depends from claim 15 and contains recitation similar to claims 4 and 5. Claim 16 stands or falls with claim 5.

Claim 17

Claim 17 contains recitations similar to claim 1 and stands or falls with claim 1.

Claim 20

Claim 20 depends from claim 17 and contains recitations similar to claims 4 and 5. Claim 20 stands or falls with claim 5.

II. The rejection of claim 2 as being unpatentable over Acker is not warranted under 35 USC 103(a)

Claim 2 requires the gutter and channel of claim 1 to be in parallel. It would not be obvious to or end the pipes 44 and troughs 14 of Acker in parallel.

First, the troughs 14 are supported from the pipes 44 as illustrated in Figs. 1 and 3. If the troughs 14 were hung from the pipes 44 via the ends 16, the elongated troughs 14 would sag in the middle thereby defeating the purpose of a uniform distribution of water along the length of the troughs 14. For this reason alone, a rejection of claim 2 as being unpatentable over Acker is not warranted under 35 USC 103 (a enclosed).

Claim 6

Claim 6 requires the areal guide means of claim 1 to be "a mesh having a fine mesh structure for distribution of a liquid with low viscosity". Acker teaches the use of a grate 50 to distribute water. There is no teaching of a mesh and particularly no teaching of a structure for the distribution of a liquid with low viscosity. Accordingly, a rejection of claim 6 as being unpatentable over Acker is not warranted under 35 USC 103(a).

Claim 7

Claim 7 requires the areal guide means to be a "mesh having a coarse mesh structure to define broad gaps between said mesh and said walls of said gutter for distribution of a liquid with high viscosity." Acker does not describe or teach such a structure.

Further, there are no gaps between the material 52 (or grate 50) and the trough 14 of Acker. Accordingly, a rejection of claim 7 as being unpatentable over Acker is not warranted under 35 USC 103 (a).

Claim 13

Claim 13 depends from claim 1 and stands or falls with claim 1.

Claim 18

Claim 18 depends from claim 17 and contains recitations similar to claim 2. Claim 18 stands or falls with claim 2.

SUMMARY

For the reasons set forth above the Final Rejection of claims 1, 2, 4-8, 10, 13, 15-18 and 20 should be reversed.

The application is believed to be in condition for allowance and such is respectfully requested.

Respectfully submitted,

Francis C. Hand
Reg. No. 22,280

CARELLA, BYRNE BAIN, GILFILLAN,
CECCHI, STEWART & OLSTEIN
Five Becker Farm Road
Roseland, NJ 07068
Phone: 973-994-1700
Fax: 973-994-1744

APPENDIX

1. A liquid distributor comprising

at least one channel for receiving a flow of liquid, said channel having a plurality of outlet apertures at longitudinally spaced apart points for an outflow of liquid from said channel in a plurality of streams;

an areal guide means extending below said channel to receive and laterally disperse at least one of the streams of liquid flowing from said apertures of said channel, said guide means having a drip edge at a lower end for dispensing drops of the liquid received thereon along longitudinally spaced apart points; and

at least one gutter disposed below said channel with said guide means passing therethrough, said gutter having a throttle means for distributing the liquid descending on said guide means by means of a hydrodynamic balance.

2. A liquid distributor as set forth in claim 1 wherein said gutter is disposed in parallel to said channel.

4. A liquid distributor as set forth in claim 1 wherein said gutter includes a pair of walls defining said throttle means.

5. A liquid distributor as set forth in claim 4 wherein said walls define a downwardly tapering region and a gap with said guide means disposed in and extending through said gap, said guide means being in contact with each said wall.

6. A liquid distributor as set forth in claim 5 wherein said guide means is a mesh having a fine mesh structure for distribution of a liquid with low viscosity.

7. A liquid distributor as set forth in claim 5 wherein said guide means is a mesh having a coarse mesh structure to define broad gaps between said mesh and said walls of said gutter for distribution of a liquid with high viscosity.

8. A liquid distributor as set forth in claim 5 wherein said walls of said gutter are made of sheet metal.

10. A liquid distributor as set forth in claim 5 wherein said drip edge of said guide means has a plurality of recesses at spaced apart intervals.

13. A liquid distributor as set forth in claim 1 wherein said outlet apertures in said channel are spaced apart a maximum distance of 1 meter and are sized to deliver liquid at a rate of from 1 to 30 liters per hour.

15. A liquid distributor comprising

a primary distribution stage including a plurality of channels for receiving liquid, each said channel having a plurality of outlet apertures at longitudinally spaced apart points for an outflow of liquid from said channel in a plurality of streams;

a plurality of areal guide means, each said guide means extending below a respective one of said channels to receive and laterally disperse at least one of the streams of liquid flowing from said apertures of said channel, each said guide means having a drip edge at a lower end for dispensing drops of the liquid received thereon along longitudinally spaced apart points; and

a secondary distribution stage below said primary distribution stage, said secondary distribution stage having a plurality of gutters, each said gutter being disposed below at least one of said channels with said guide means passing therethrough, said gutter having

a throttle means for distributing the liquid descending on said guide means by means of a hydrodynamic balance.

16. A liquid distributor as set forth in claim 15 wherein said gutter includes a pair of walls defining said throttle means and wherein said walls define a downwardly tapering region and a gap with said guide means disposed in and extending through said gap, said guide means being in contact with each said wall.

17. A column comprising

a structured packing; and

a liquid distributor disposed above said packing for distributing liquid over and onto said packing, said distributor having a primary distribution stage including a plurality of channels for receiving liquid, each said channel having a plurality of outlet apertures at longitudinally spaced apart points for an outflow of liquid from said channel in a plurality of streams; a plurality of areal guide means, each said guide means extending below a respective one of said channels to receive and laterally disperse at least one of the streams of liquid flowing from said apertures of said channel, each said guide means having a drip edge at a lower end for dispensing drops of the liquid received thereon along longitudinally spaced apart points onto said packing; and a plurality of gutters, each said gutter being disposed below at least one of said channels with said guide means passing therethrough, said gutter having a throttle means for distributing the liquid descending on said guide means by means of a hydrodynamic balance.

18. A column as set forth in claim 17 wherein each said gutter is disposed in parallel to and below a respective one said channels.

20. A column as set forth in claim 17 wherein each said gutter includes a pair of walls defining said throttle means and wherein said walls define a downwardly tapering region and a gap with a respective said guide means disposed in and extending through said gap, said respective guide means being in contact with each said wall.

#307349